

Applicants:

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- NHK (Japan Broadcasting Corporation).

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## CLAIMS

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[The scope of a claim for utility model registration]

[Claim 1]BS retransmission-of-message device having a retransmission unit characterized by comprising the following.

A channel selection means to tune in a desired channel from an inputted BS signal.

A demodulation means for restoring to a BS signal tuned in by this channel selection means to a predetermined signal.

A modulation means which processes a signal to which it restored by this demodulation means, performs direct modulation to single mixing parts, and is sent out as a television signal of a desired channel.

A control means which controls said channel selection means and a modulation means.

[Claim 2]Said channel selection means has a frequency means for locking by a BS tuner and AFC, A demodulation means has a VIDEOQPSK demodulation means which restores to an output signal from said BS tuner, and a PCM demodulation means which performs a voice recovery further, A modulation means an output of a synthesizing means which performs composition of TV multiplexer encoder for abnormal conditions of TV sound, level adjustment of a video signal, a digital disposal circuit that modulates FM of an audio signal, this video signal, and an audio signal, and this synthesizing means in predetermined frequency with an output from a transmitter. The BS retransmission-of-message device according to claim 1 provided with an input means which gives an information set of a channel of a television signal which has single mixing parts to change and is broadcast again to a control means with BS channel with a switch.

[Claim 3]Claim 1 provided with a synthesizing means which has said two retransmission units, compounds a TV output signal from each retransmission unit, and is used as two channels, or BS retransmission-of-message device given in 2.

[Claim 4]It is BS retransmission-of-message device of \*\* to any 1 paragraph of claims 1 thru/or 3 provided with a discrimination means sent out on an identical line so that a BS signal and a television signal from a retransmission unit may not interfere, respectively.

## DETAILED DESCRIPTION

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[Detailed explanation of the device]

[0001]

[Industrial Application]

About community reception institutions, such as collective housing, an office building, and a hotel, this design receives satellite broadcasting waves (BS signal), and is related with BS retransmission-of-message device which operates as an all channel TV modulator which outputs TV (television) broadcast wave of a UHF band.

[0002]

[Description of the Prior Art]

As this conventional kind of a BS retransmission-of-message device, the device of composition of being shown, for example in drawing 4 is known. In the figure, 91 is united in practice, although an AC receptacle, 94A, and B are mixed distributing plates, and BS input terminal and 92 were divided for convenience by a diagram and have indicated BS monitor terminal and 93. A retransmission-of-message device for changing into a television signal BS-IF signal into which the electric power unit was inputted into 95 and a power distribution board, 97A, and B were inputted 96, and re-sending it out, An RF output terminal for a straw man in case 99 does not use an above retransmission-of-message device, and 100 to output a television signal, and 101 are the RF output monitor terminals for monitoring a TV output signal.

[0003]

A deer is carried out and this example explains the case where two retransmission-of-message devices are mounted. The BS signal inputted from BS input terminal is inputted into each retransmission-of-message device 97A and B via the mixed distributing plates 94A. A BS signal of abbreviation-10 dB is decreased and is outputted from the BS monitor terminal 92. After the AC power inputted from AC receptacle 93 is sent to the electric power unit 95 via the mixed distributing plates 94A, it is sent out to the voltage distributing plates 96 as a DC power supply of predetermined voltage, and is further supplied to each retransmission-of-message device 97A and B as a power supply. From the electric power unit 95, the DC power supply for superimposing DC voltage with the BS input terminal 91 is supplied to mixed distributing plates via the switch.

[0004]

Each retransmission-of-message device 97A and the BS signal inputted into B are changed into the television signal of a VHF band within this retransmission-of-message device 97A and B, and is outputted to the mixed distributing plates 94B. In these mixed distributing plates 94B, mix each retransmission-of-message device 97A and the television signal sent out from B, and it outputs to RF output terminal 100, and outputs to an RF output monitor terminal by considering the signal attenuated abbreviation-20 dB as the output for a monitor. It is equipped with the straw man 99 in order to prevent reflection and other adverse effects into the slot for retransmission-of-message devices which is not used.

[0005]

Next, the appearance of this conventional BS retransmission-of-message device is explained.

Drawing 5 shows the front view. As for B, as for mixed distributing plates and 95, a power distribution board and 97 are each retransmission-of-message device an electric power unit and 96 among [ 94A ] a figure, and, in the case of drawing 4, one of these becomes the straw man 99.

[0006]

Respectively the mixed distributing plates 94A, B, the electric power unit 95, the power distribution board 96, and each retransmission-of-message device 97 were constituted for every

block, incorporated them in the case, and made them one large-sized BS retransmission-of-message device so that clearly from this figure.

[0007]

Next, the composition of the above retransmission-of-message device 97A and TV modulation part in B is explained. Drawing 6 is a block diagram showing the main composition. In a figure, the signal which modulated the audio signal and video signal which were recovered from the demodulation section of the whole page with the intermediate frequency, respectively, and was compounded is inputted into the node N1, and it is inputted into the 1st mixing parts 111 via the amplifier 110.

[0008]

These 1st mixing parts 111 change into high predetermined frequency the signal modulated by VCO120 with the aforementioned intermediate frequency. A part of output of said VCO120 is inputted into the phase discriminator 123 via the counting-down circuit 122. The signal which passed the amplifier 126 and the counting-down circuit 124 from the reference signal transmitter 125 is also inputted into said phase discriminator 123. These two signals are compared, that difference is inputted into the control amplifier 121, and the PLL loop is formed so that the signal of predetermined frequency may be outputted and the signal of said VCO120 may be locked.

[0009]

The output from the 1st mixing parts 111 is inputted into the 2nd mixing parts 114 via the band pass filter 112 and the amplifier 113. The frequency of TV channel is made to be outputted by these 2nd mixing parts' 114 inputting the output of VCO130, and changing into low frequency. The signal which inputted a part of output of VCO130 into PLL128 when this VCO130 inputted into PLL128 the data signal set up with the channel selection switch 131. The reference signal which passed the amplifier 126 and the counting-down circuit 127 from the reference signal oscillator 125 is compared, the output of the difference of these two signals is inputted into the control amplifier 129, and the PLL loop is formed. PLL128 is the channel setting switch 131 and is controlled to change frequency of VCO130 so that it may become the frequency corresponding to the channel set up arbitrarily.

[0010]

The output of said 2nd mixing parts 114 is outputted to the node N2 via the low pass filter 115, the amplifier 116, the volume 117 for RF level adjustment, the amplifier 118, and the low pass filter 119. The data signal from said channel selection switch 131 is inputted into the low pass filter 119, and the interference of frequency according to the selected channel is cut into it.

[0011]

[Problem(s) to be Solved by the Device]

In order to include in the case of the size which the mixed distributing plates 94A, B, the electric power unit 95, the power distribution board 96, and each retransmission-of-message device 97 grade comprise such a conventional BS retransmission-of-message device for every block, respectively, and was moreover decided, It became large-sized and the retransmission-of-message device 97 according to TV channel which transmits was needed, or the channel which is not used had to equip with the straw man and had caused increase of cost.

[0012]

Also in the modulation part of a television signal, two steps of mixing parts 111,114 were needed from problems, such as an interference, there were many part mark, and adjustment was also troublesome.

[0013]

With the conventional BS retransmission-of-message device, since the frequency band of the television signal to transmit was a VHF band, the channel which can be used by the area changed, or it was limited and there was a problem in respect of flexibility.

[0014]

The place which this device was made in view of this point, and is made into that purpose is small and simple composition, and is low cost.

And it is in providing flexible BS retransmission-of-message device.

[0015]

[Means for Solving the Problem]

This design is a predetermined signal about a BS signal tuned in by channel selection means 4 to tune in a desired channel from an inputted BS signal, and this channel selection means 4 that an aforementioned problem should be solved.

We decided to have the retransmission unit provided with the demodulation means 5 for it being alike and getting over, the modulation means 6 sent out as a television signal of a desired channel processing a signal to which it restored by this demodulation means 5, and applying direct modulation to single mixing parts, and said channel selection means 4 and the control means 7 which controls the modulation means 6.

[0016]

Said channel selection means 4 has a frequency means for locking by BS tuner 41 and AFC42, The demodulation means 5 has the VIDEOQPSK demodulation means 51 which restores to an output signal from said BS tuner 41, and the PCM demodulation means 52 which performs a voice recovery further, The modulation means 6 an output of the synthesizing means 64 which performs composition of TV multiplexer encoder 61 for abnormal conditions of TV sound, level adjustment of a video signal, the digital disposal circuit 62 that modulates FM of an audio signal, this video signal, and an audio signal, and this synthesizing means 64. We have the single mixing parts 65 changed into predetermined frequency with an output from the transmitters 66 and 67, and decided to have the input means 8 which gives an information set of a channel of a television signal broadcast again to the control means 7 with BS channel with a switch.

[0017]

We decided to have the synthesizing means 9 which has said two retransmission units, compounds each retransmission unit 10A and a TV output signal from B, and is used as two channels.

[0018]

We decided to have the discrimination means 12 sent out on an identical line so that a system of a BS signal and a system of a television signal from a retransmission unit may not interfere, respectively.

[0019]

[Function]

The channel selection means 4 tunes in desired BS channel from BS-IF signal inputted from BS antenna and the BS converter, and outputs it as an FM signal of predetermined frequency with which the video signal and the audio signal were intermingled. The demodulation means 5 restores to the FM signal with which the video signal and audio signal of BS channel tuned in by the channel selection means 4 were intermingled to a predetermined video signal and audio signal. Using the signal to which it restored by the demodulation means 5, the modulation means

6 applies direct modulation to single mixing parts, and sends it out as a television signal of a desired channel. And the control means 7 controls the channel selection means 4 and the modulation means 6 by the channel input from the input means 8, etc., and performs setting out of a channel, etc. by them.

[0020]

It becomes flexible low cost BS retransmission-of-message device with simple composition by having the retransmission unit 10A by such composition, and B.

[0021]

By what it has for the synthesizing means 9 which provides said two retransmission units, compounds each retransmission unit 10A and the TV output signal from B, and is used as two channels. It becomes what is called a compact 2 wave type, i.e., the retransmission-of-message device of two channels, with simple composition with a function required for a small-scale community reception institution.

[0022]

BS-IF signal can be sent out and it can be made to connect with other BS tuners by having the discrimination means 12 sent out on an identical line so that the system of the BS signal for a monitor and the system of the television signal from a retransmission unit may not interfere, respectively.

[0023]

[Example]

Next, it explains, referring to a figure for the example of this design. Drawing 1 is a block diagram showing the basic constitution of the example of this design. BS output terminal which outputs the BS signal which inputted into other retransmission units BS input terminal into which, as for 1A and B, BS-IF signal from BS antenna is inputted, 2A, and B in the figure, and 3 are BS input terminals for sending out BS output to an RF output terminal.

[0024]

4 tunes in the BS signal of a desired channel from the inputted BS signal, A channel selection means to output as an FM signal with which the video signal and the audio signal were intermingled, the demodulation means which extracts an image demodulation signal and a voice demodulation signal from the FM signal of the above [ 5 ], respectively, 6 performs direct modulation using the image demodulation signal and voice demodulation signal to which it restored by the aforementioned demodulation means, The modulation means for outputting as a predetermined television signal, the control means to which 7 carries out setting out of the channel of said channel selection means 4 and the modulation means 6, etc., The input means to which 8 carries out the input of a setting-out channel, etc. to this control means 7, 10A, and B are the retransmission units provided with these channel selection means 4 thru/or the modulation means 6, the control means 7, and the input means 8.

[0025]

9 compounds the output of each retransmission unit 10A and B, and is a television signal of two channels.

The synthesizing means for sending out and 12 the BS signal inputted from said BS input terminal, and each retransmission unit 10A and the television signal sent out from B without having an adverse effect on each circuit, An RF output terminal for the dispensing means which distributes the television signal or BS signal with which the discrimination means for sending out on the same transmission line and 13 are outputted, and 14 to send out the television signal or BS signal to resend, and 15 are RF monitor terminals for monitoring an RF output signal. The

retransmission unit 10A and B have those with two, an input terminal accompanying this, etc., respectively so that clearly from a figure, but the details of the retransmission unit of another side are omitted. Thus, it is because having considered it as 2 wave type can exhibit enough a function required as a retransmission-of-message device in a comparatively small-scale community reception institution if it can retransmit a message using 2ch.

[0026]

A deer is carried out, and BS-IF signal inputted from the BS input terminal 1B is tuned in to desired BS channel by the channel selection means 4, and is changed and outputted to the FM signal of predetermined frequency. Directions of the channel which tunes in this channel selection means 4 by the control means 7 are given. Said FM signal is a signal with which the video signal and the audio signal were intermingled.

[0027]

It restores to the FM signal outputted from the channel selection means 4 to an image demodulation signal and a voice demodulation signal by the demodulation means 5. This image demodulation signal and a voice demodulation signal are changed into the television signal of a predetermined channel by the modulation means 6. This modulation means 6 also receives directions of the control means 7, and sets up a channel. Circuitry is simple in order that this modulation means 6 may perform direct modulation to single mixing parts.

[0028]

Thus, the mixing means 9 can be mixed with the television signal from other retransmission units 10A, and the outputted television signal can be made now into the television signal of arbitrary 2ch. The output of this mixing means 9 is outputted to the same transmission line by the discrimination means 12 from RF output terminal 14 separately from the BS signal inputted from the BS input terminal 3. This discrimination means 12 operates as a filter which separates both signals so that a television signal and a BS signal may not interfere.

[0029]

Thus, it is BS retransmission-of-message device which can be equivalent to arbitrary channels with a two waves type with simple composition.

[0030]

Next, the more concrete example of this design is described. Drawing 2 is a block diagram showing the concrete composition of this design. Identical codes are given to the same component as drawing 1, and explanation is omitted.

[0031]

The BS signal which was inputted from the BS input terminal 1B, or was directly inputted into the BS input terminal 1B is inputted into BS tuner 41 which is the channel selection means 4 via the BS input terminal 1 A->BS output terminal 2A of other retransmission units 10A. In this BS tuner 41, the aforementioned BS input terminal is connected to the BS output terminal 2A in the state of through. It restores to the FM signal outputted from BS tuner 41 to a video signal and a PCM sound signal by VIDEO / QPSK demodulation 51, Furthermore, an audio signal is carried out PCM recovery 52, is made into an analog L signal component and R signal component, is made into a correct level in the volumes 55 and 56 for level adjustments via the low pass filters 53 and 54, respectively further, respectively, and is outputted to the modulation means 6 with said video signal.

[0032]

In the modulation means 6, a video signal is clamped in the digital disposal circuit 62, and is adjusted to a correct level by the volume 63 for image abnormal-conditions adjustment. Voice

multi-processing of L and the R audio signal is carried out with TV multiplexer encoder 61, and they modulate FM in the digital disposal circuit 62. Then, it is inputted into the mixing parts 65 via the resistance R1 for composition, R2, and R3. The output of the oscillator (VCO) 67 is inputted into the input of another side of these mixing parts 65, said signal whose number is two is compounded, and it is changed into the television signal of predetermined frequency.

[0033]

Thus, the mixing parts 65 for abnormal conditions will have been one step, i.e., single mixing parts. Thus, it is because a high frequency component is cut with the low pass filter 69 and the DAIPU REXX filter 12 which the thing the number of the mixing parts 65 may be [ thing ] one has after the mixing parts 65 in the composition of this design and interference ingredients are decreased to the grade which a problem does not produce.

[0034]

The phase lock of said VCO67 is carried out by the loop formed by PLL66, and the frequency by which this PLL66 is locked with the directions from the control means 7 is controlled. That is, this control means 7 is constituted by CPU and its periphery article, the predetermined control program, etc., and gives signals, such as data, a clock, and enabling, to PLL66 as TV channel selection information according to TV channel inputted from the input means 8 of a DIP switch etc.

[0035]

Signals, such as data, a clock, and enabling, are similarly given as BS channel information to said BS tuner 41. Frequency data was given to the control means 7 via D/A converter 42, AFC (automatic frequency control circuit) was constituted from BS tuner 41, and the frequency lock is prevented from separating.

[0036]

The output of said mixing parts 65 is given to the synthesizing means 9 as an output of the retransmission unit 10A via the amplifier 68 and the low pass filter 69. The signal from other retransmission units 10B is also inputted into this synthesizing means 9, and the television signal of two different frequency, i.e., a channel, serves as 2 wave type which can be sent out to the same transportation lines. This synthesizing means 9 is the same as that of the composing device used for the so-called composition of a general television signal etc., and omits that detailed explanation.

[0037]

The output of said synthesizing means 9 is sent out on the same transportation lines so that it may not have an adverse effect on mutual circuit operation with BS-IF signal inputted from the BS input terminal 3 by the discrimination means 12. Other signal components are prevented from this discrimination means being a filter called what is called DAIPU REXX filter, separating a BS signal zone and a television signal zone, and mixing it in a mutual circuit. Reception of the BS broadcasting in the accepting machine which can send out a BS signal to the same transportation lines as a television signal, and has a BS tuner by this is possible.

[0038]

The signal sent out from said discrimination means 12 is outputted to RF output terminal 14 and the RF monitor output terminal 15 by the dispensing means 13, respectively. Said dispensing means 13 is what is called a distributor, is acquired by a well-known arts means, and omits the detailed explanation. The cable linked to the accepting device of a community reception system, etc. is connected to RF output terminal 14. And in order to monitor the check of the signal, etc., RF monitor output terminal is used.

[0039]

In this example, the signal of a UHF band is used as a television signal, and use of an all channel is possible. That is, it is possible for the flexibility of the channel which can be used by using a UHF band compared with the VHF band where an usable channel changes with areas to increase, to be managed even if flexibility does not use increase and an expensive SAW filter, and to hold down cost low.

[0040]

Next, the appearance of BS retransmission-of-message device concerning this design is explained. Drawing 3 (a) shows the plan, (b) shows a front view, and (c) shows a bottom view. Identical codes are given to drawing 2 in a figure, and an identical configuration element, and the explanation is omitted. The volume to which 81 and 82 adjust the RF output level which is a TV output signal in a figure, As for 83, a power cord and 8 perform channel setting of the channel of a UHF band, and BS channel which is a television signal by this a fuse holder and 84 with the DIP switch of the rotary system which is an input means, as for a grounding terminal and 85. 80 is a main part.

[0041]

Thus, it turns out that the retransmission unit 10A, B, a power supply, etc. are stored in one case as one, and BS retransmission-of-message device concerning this design is compact compared with the type of conventional drawing 2.

[0042]

[Effect of the Device]

A channel selection means to tune in a desired channel from the inputted BS signal as mentioned above according to this design, The demodulation means for restoring to the BS signal tuned in by this channel selection means to a predetermined signal, The modulation means to which abnormal conditions are applied by single mixing parts and which is sent out as a television signal of a desired channel by the signal to which it restored by this demodulation means, By having the retransmission unit provided with said channel selection means and the control means 7 which controls a modulation means, it becomes BS retransmission-of-message device with small size and low cost flexibility with simple composition.

[0043]

By what it has for a synthesizing means which provides said two retransmission units, compounds the TV output signal from each retransmission unit, and is used as two channels. It becomes what is called a compact 2 wave type, i.e., the retransmission-of-message device of two channels, with the simple composition provided with the required function in a comparatively small-scale community reception institution.

[0044]

By having a discrimination means sent out on an identical line so that a BS signal and the television signal from a retransmission unit may not interfere, respectively, BS-IF signal can also be sent out to the same line as a television signal output, and can receive BS broadcasting directly with the accepting machine which has a BS tuner.